



## USDA Forest Service Southern Research Station Project Fact Sheet

### TESTING AND MODELING THE EFFECTS OF GROWING SEASON PRESCRIBED FIRE ON EROSION AND NUTRIENT TRANSPORT IN THE SOUTHEASTERN PIEDMONT PINE FOREST

#### A Case Study on the Long Cane Ranger District, Sumter National Forest

##### BENEFITS

- Stimulates forest-grassland vegetative community
- Enhances nutrient cycling
- Improves wildlife habitat
- Reduces incidence and intensity of wildfire by reducing fuel load
- Improves species competition and wood quality
- Improves forest aesthetics
- Protects water quality

##### APPLICATIONS

Developing the needed fire effects and monitoring information is fundamental to implementing a sustainable prescribed fire program in Piedmont forests. Stakeholders include National Forests, state forestry agencies, non-governmental agencies and conservation groups, land managers, and policy makers.



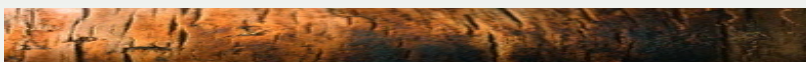
##### Understanding Fire Intensity Effects on Various Fuel Loads and Mechanical Treatment will Provide Management Recommendations for Local and National Forest Managers

The pine forests in the southeastern Piedmont region are largely developed on highly eroded, nutritionally poor sites. Overstocked conditions, high fuel loads, undesirable habitat, and fragile soils make fire prescriptions uncertain. The risks are heightened with the prospects of hot, growing season fires that are considered necessary to achieve native vegetation communities. Accordingly, southern forest managers need an understanding of the effects of fire intensity, especially with respect to the potential for destabilizing the site and they need tools for planning and assessment purposes.

The National Forest Service partnered with the Southern Research Station in 2003 (SRS-4103 in Charleston, SC and SRS-4703 in Auburn, GA) and College of Charleston to examine these needs on the Long Cane Ranger District in the SC Piedmont. Researchers will study the effects of a high intensity summer burn on mechanically chipped, high fuel, and low fuel areas. The project will provide prescription recommendations in the form of fact sheets, research publications, a web-based Water Erosion Prediction Project (WEPP) model workshop, field demonstrations, and a website for information dissemination and technology transfer. Results will have implications for local decision-making relevant to fuels management, water quality, and forest ecosystem sustainability.



Figure 1: Area of high fuel load that will be burned summer 2004.



## PROJECT DESCRIPTION

**Objectives:** This project is designed to provide local, state, and private forest managers with an understanding of how prescribed fire, mechanical thinning and chipping, and the combination thereof affect soil erosion and fertility, fuel condition, productivity, water quality, and vegetative community composition.

Researchers will directly measure soil movement over a disturbed Piedmont landscape following a high intensity, summer burn and conduct analyses to determine the potential for reactivation of destructive erosional processes following the treatments. Specific treatments include burning on high intensity fuel, low intensity fuel, mechanically thinned and chipped, and control areas (n= 24, 6 on each treatment).

Erosion measurements include gully fences and permanent runoff plot collectors. Nutrient analyses include soil and vegetation samples, and runoff and waterway samplers. Researchers at the Rocky Mountain Research Station are adapting an erosion modeling program, WEPP, to predict soil erosion for disturbed forested ecosystems in the West. This project intends to extend those efforts to validate the WEPP model for southeastern forested ecosystems. Lastly, vegetation monitoring will occur on these sites to understand successional change and if the desired vegetative communities are produced by treatment.

## PROGRESS & MILESTONES

- Researchers initiated a baseline study June 2003.
- Permanent plots were established and baseline sampling occurred August 2003.
- An establishment report was produced September 2003.
- Mechanical chipping occurred October 2003 on the study area, removing all understory vegetation and leaving it on the forest floor to cure.
- Installation of water samplers, gully erosion fences, and runoff collectors will occur by February 2004.
- A high intensity burn is planned for summer 2004.

## COLLABORATORS

USDA Forest Service  
Francis Marion & Sumter  
National Forests  
Columbia, SC

Southern Research Station  
Charleston, SC and  
Auburn, GA

Rocky Mountain Research  
Station  
Moscow, ID

College of Charleston  
Geology & Geosciences  
Charleston, SC

## FOR INFORMATION, CONTACT:

Lindsay White  
Forest Ecologist  
USDA Forest Service  
Center for Forested  
Wetlands  
2730 Savannah Hwy  
Charleston, SC 29412  
Phone: (843)766-0371  
e-mail:lhwhite@fs.fed.us

Elizabeth LeMaster  
District Ranger  
USDA Forest Service  
Long Cane Ranger District  
810 Buncombe Street  
Edgefield, SC 29824  
Phone: (803) 637-5396  
e-mail:elemaster@fs.fed.us

January 2004

